Situated learning in virtual worlds and identity reformation

Book Section

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Abstract

Situations shape how we learn and who we are. This chapter reviews two case-studies in order to identify key points of interplay between physical world and virtual world identities and how this impacts on identity reformation. The first study reviews findings of a study that explore the use of simulated language learning scenarios (i.e. a Spanish virtual house) and gaming within a virtual world. The second study presents evidence from a comparison of virtual and gaming world interactions and a comparison of Second Life tutorial situations (i.e. environments that are; realistic compared to surreal, enclosed compared to open, formal compared to informal). Identity reformation was enabled and inhibited by conceptual links (i.e. students' physical world identities, memories and concepts of self) between virtual and physical world situations. However, academics' role in identity reformation within these new learning contexts is posed as the current barrier to virtual world learning.

Introduction

It was the educational philosopher Rousseau (1762) who proposed that education shapes who we are and laid one of the foundations for the notion of learning as a route to reforming our identity. Personal development is a key concept in identity reformation and has great resonance with the concepts of lifelong learning since we can never cease to learn nor develop and reform our identities. However, as Kehily (2009: 6) notes 'the temporality of identity is commonly overlooked … identity is never complete and can incorporate aspirational and fantasy elements'. The transient nature of identity and its tendency towards retaining potential inaccuracies have been noted as relating to social situations (Goffman, 1959; Giddens, 1991) However, the physicality of a situation, whether it be our home, an

airport, or up a mountain, are factors of situations that are continually overlooked. Yet to learn to climb a mountain or to deal with a situated phobia (e.g. claustrophobia) is tightly interwoven with physical situations and has both an impact on our notions of identity and our ability to change that identity through learning.

A key aspect of elearning, within virtual worlds in particular, are their potential to allow exploration and continual reformation of our identities through the rapid interaction with different situations. Yet societal, institutional and social pressures continually seek to confine, categorise, stabilise and control situations and consequently identities within these worlds. The tensions between virtual world identities, the value of situations and their impact on identities is central to the concepts explored within this chapter.

Initially virtual environments were used for entertainment and training purposes. Virtual simulations have continued to be used for many years as learning environments for various conditions (Smets et al, 1995; Delwiche, 2006). However, the objectives of virtual reality have digressed to three main themes (Fluckiger, 1995):

1. The user's exploration of the virtual world.
2. The user's actions on the physical world through virtual replications (simulations).
3. The user's interaction with other users participating in the virtual world.

This chapter concentrates primarily on 1, the concept of virtual world exploration, whilst there are elements of 2, the use of virtual replications, in the exploration of language learning simulation. However, even though the main focus of these studies is not directly on the interaction of students with others a student's concept of social context has a strong impact on all of their interactions. This means that indirectly students' prior interactions have an impact on all their subsequent interactions inworld and are reviewed with this in mind. Psychologically we have built into us the concept of acceptable behaviours for appropriate places, for example, even if we were alone in a traditionally public space (e.g. a supermarket) we would feel uncomfortable completing a private act (e.g. taking off our clothes in this context). This is an example of social norms guiding our behaviours for 'places' irrespective of our current social interactions. Social norms (such as politeness and acceptable behaviour) guide social interactions and determine socially rich responses irrespective of whether a system was designed to cater for them (Laurel, 1993; Reeves & Nass, 1996). Based on existing knowledge, users construct social representations that allow them to recognize and contextualize social stimuli. These representations originate from social interaction and help us construct an understanding of the social world, enabling interaction between groups sharing social norms within these representations (Augoustinos & Walker, 1995). Social situations provide cues that allow people to make assessments of those situations. Harrison & Dourish (1996) argue that it is a *sense of place* that guides social interactions. This is because social norms guide our perceptions of spaces allowing us to interpret them as

places and adapt our behaviours accordingly. Virtual worlds have long been understood to allow end-users an increased sense of place for interactions. However, there is still more to be understood about how this impacts on our learning and subsequent identity reformation.

This chapter builds upon the chapter XX, Reinventing ourselves, (this volume) and previous published literature (Sweeney and Adams, 2009; Adams, in press) focusing on reformation of identity specifically within virtual world situated learning. Therefore, this chapter will help those specifically using virtual worlds for elearning to understand identity reformation within these contexts and to design the learning to support it. Two studies in virtual world language learning and situated elearning will be used to support an understanding of the diversity of scenarios for implementing online identities within virtual world contexts e.g. place for tutorials, simulations of scenarios. This will enable a deeper understanding of the virtual world technologies (e.g. Second Life, Runescape) and practices (e.g. simulation and game interaction, situation design) that support situated elearning for students' identity formation. The study findings provide an insight into the potential benefits and barriers to students' virtual world identity reformation. The findings will be used to support conclusions about how to create plans for situated good practice in virtual world learning identity reformation.

Virtual worlds and education

For centuries we have sought to develop ourselves and our concepts of self through our personal exploration in work and play. Who we are can therefore be tightly interwoven with what we have learnt (Bernstein and Solomon, 1999; Lave & Wenger, 1991). This learning, however, is not a static individualistic concept as our sense of self and learning as part of that identity is embedded in our social and cultural contexts. As Lave and Wenger (1991) emphasise, learning within any domain is more than a formal acquisition of knowledge, it has a strong social element. Bernstein (Bernstein and Solomon, 1999) highlighted this strong interplay between what we learn within a social context and our formation of social identities. This aligns well with the fluid and social nature of social worlds. As noted in chapter XX of this book the concepts of situated learning highlight how learning and its development relates to socio-cultural contexts and how this impacts on our identities.

Goffman (1959) highlights that our identities are not fixed. Students are one person inhabiting multiple social worlds. We have complex identities that we adapt and present alternative sides of for different social situations. Bowker and Star (1999) note the importance of space and time in the complexity of a learning process and how this increases the potential for chaos. Latour (1997) emphasises our need to create order in these processes and the increased likelihood of disorder elsewhere. Education, through supporting our development and identity

reformation, often involves widening the gap between these worlds before some resolution is made. However, it has been argued, that this gap should never be fully bridged otherwise how can we ensure that students are encouraged to continually develop and transcend their immediate practices and identities (Guile 2006)? Learning will inevitably always involve dissonance and disequilibrium, not only within our own identities but upon others, as identity reconstruction can have a dramatic impact on organisational and socio-cultural objectives (Alvesson & Wilmott 2002).

Identity reformation and situated learning

Collaborative virtual environments have been argued as providing remotely located users with the ability to collaborate via real interactions in a shared artificial environment (Brna and Aspin, 1997). The advantages of virtual reality for collaborative learning are frequently argued by constructivists[1] to relate to the importance of authentic context (Vygotsky, 1962, 1978). However, the real value of virtual worlds within an elearning context are disputed. Some educationalists are sceptical about using virtual worlds for learning (Foster, 2008). Others, however, are enthusiastic and feel it is possible to achieve ambitious educational goals (Oishi, 2007). Ultimately these resources provide students with an opportunity to recreate their physical world identity through supported staged exploration and development of their digital identities. This is a difficult process for a student to undergo as they are required to balance and merge multiple digital identities with their physical world identities whilst all are in constant flux through the learning process.

Technology can increase the potential for access to learning within a variety of different contexts. These have been reviewed from different perspectives with regard to situated learning (Lave and Wenger, 1991; Tuomi-Gröhn et al, 2003), situated design (Suchman, 1987; Star & Griesemer, 1989) and boundary objects (Star and Griesemer, 1989). This not only has the potential to speed up the transformational potential of education but also distort how the processes occur. Whilst it is important to understand the reformation of virtual world identities, it is also important to understand how this has an impact on ourselves and others in the physical world. Understanding the strong link between identities and virtual worlds would imply a strong link to virtual worlds that can act as a bridge between real and artificial realities. However, understanding how well this supports transitions or removes us from the physical world into an artificial world with artificial identities needs to be understood to support effective identity reformation.

[1] Constructivism is a predominant psychological process theory in collaborative learning. They highlight the importance of learning environment actions, real interactions and translating abstract concepts into those that are concrete. For further information see Vygotsky (1978).

Key affective concerns for teaching and learning are student focus and motivation. Anything that helps the student remain motivated and will focus their attention will aid in the process of learning, whereas conversely anything that distracts and de-motivates the student will hinder them. It could be argued, therefore, that situated attention through immersion in a virtual world is a key aspect of virtual world learning. Virtual reality (VR) communication environments have been argued to provide a natural, intuitive environment for communication whilst removing some of the social taboos from social interactions (Kaur, 1997). However, as virtual worlds increase in their appearance as accurate replications of reality there is an increased likelihood that users will make inaccurate assumptions about the world's capabilities and limitations. This could have an inappropriate impact on end-users' task attention and ultimately immersion in the environment and task. For example, a realistic classroom could produce user assumptions that the environment's walls and doors retain physical world characteristics, thus implicitly making conversations within a VR room appear private when they may actually be public with potential privacy and noise pollution issues.

The issue of 'social identity' in relation to language learning has been a subject of discussion for a long time. Tajfel (1974, 1981) believed that identity is a result of group membership and that individuals may chose to leave it if they don't identify with the elements of social identity prevailing in the group. Giles and Johnson (1987) focused on language as a salient marker of group membership and social identity. Many other interactional sociolinguists have followed the same thread and although in many cases the main discussion is around the importance of ethnicity and other environment related features of social identity, what is interesting for our analysis is whether, in this case, there was a common social identity around language but perhaps more importantly around the environment in which interactions were taking place.

Reformation of Self in Virtual Worlds

Research by Wadley and Gibbs (2010) presents contrasting perspectives over avatar usage by users. On the one hand, do users employ avatars to present a character in a virtual world? Or to represent their true identity? Initially, it could be thought that on-line environments that allow for role playing would facilitate the use of avatars for character representation whilst more formal context would reveal the true identity. However, identity formation and reformation is far more complex than this simple binary distinction. Do we ever really present our 'true identity' as, since Goffman (1959) has highlighted, we have several sides to ourselves that we present in different situations? It would be easier to think of our students as having several sides to their identity that they reveal and present in different ways according to the relevant situations. As virtual worlds can easily present those different situations, they can potentially allow users to explore and

present those different sides more effectively. Savin-Baden (2010) revisited these issues with the concept of 'multiplication' which relates several concepts of 'self' back to consistent physical world identities. The question of whether these virtual concepts of self are completely separate identities or parts of the whole self and how these representations relate to real concepts of self is an interesting concept which requires further exploration. Workman (2008) reflects a stronger situated learning perspective with regard to communities with Lave and Wenger's (1990) notion of Communities of Practice. Many of these approaches connect to the concept of social norms and behaviours within a community. This would mean we adapt our presentation of self not only to situation but to the social norms that seem applicable in that situation.

Peachey and Withnail (in press) review the concepts of consistent avatars linked to the stability of social identities. They argue, as does Schroeder & Axelsson (2000), that continuity in an avatar's physicality can be linked to effective community building as social norms of concepts and behaviours are more effectively established. However, strong communities require an acceptance for different levels of engagement and identity formation within that group. Lave and Wenger (1991) highlight the notion of different levels of community engagement through the concepts of legitimate peripheral participation. They argue that communities need to allow participation at different levels and that it is legitimate to have initial peripheral participation within many communities. This would mean that virtual world student participant should allow different levels of engagement and ways to present our identity from those that are inconsistent to those that are consistent. Peachey and Withnail (in press) present a detailed account of an avatars changing identity as two members became increasingly engaged with the community. This should be a model of a health sequence of engagement with a community.

Case Study 1: Spanish language learning house simulation and game

Language and how we use it can be a linchpin to how we interact with others and thus how we define ourselves and others within different cultures. The interaction between a country's culture and its language is tightly interwoven. Learning a language must therefore mean understanding its cultural context. The spoken language is also closely linked to social norms and social interaction patterns within that society. Those teaching and learning languages have understood these issues for many years and have often been at the forefront of utilising novel teaching approaches that understand learning within a cultural context. For many years, students learning a language have 'role-played' spoken language interactions to understand language within specific scenarios (e.g. shopping, eating out and booking a hotel room). Language students have also taken part in social learning games (e.g. nursery rhyme and number games) to help gain

vocabulary skills. The use of these simulated situations and gaming approaches tie in closely with virtual world interactions. How these technical advances of traditional approaches impacted on language learning was a key focus of this research project. Within this chapter specific findings that were related to identity formation and re-formation are detailed.

Study Method

This study related to language elearning and focused on specific support for this discipline. It also reviewed the use of situated constructions i.e. a Spanish house, a Spanish family and a Spanish waiter to support investigation of language, norms and identities within these situations.

Two scenarios were investigated:

- Spanish home simulation with artificial avatars representing the members of a Spanish family speaking about their lives in this home.
- Spanish tutorials within a standard virtual world setting with a game playing component incorporated (both virtual world and verbally). An interactive bar with barman avatar was present (see below).

Participants were 24 learners of Spanish at different levels of proficiency, from low-intermediate to high. They were recruited among staff and students at The Open University and The University of Cambridge.

Spanish home The Spanish home simulation was designed and developed by Eygus Ltd (http://www.eygus.co.uk/AnnaPeachey.html) from an original idea by the second, third and fourth author. The simulation presented a Spanish house and garden and labelled all the objects within that home. Once a participant clicked with their mouse over the object, the Spanish word popped up and an audio clip was played where the Spanish pronunciation of the word was given. Students were able to wander with their avatar through this simulation exploring and clicking on all the different objects within this environment. The environment also has a selection of family members who are represented with avatars (e.g. Father cooking in the kitchen). These avatars were static and specifically designed to look distinctly different from the virtual world avatars (e.g. they looked like card-board cut-outs) this was to reduce confusion about the nature of these avatars. Once the static family avatars are clicked on they gave an account (in Spanish) of who they were and what they were doing in their home (e.g. cooking). The home had interesting cultural and socio-psychological aspects planned into it. A balcony was placed on the front of the house, the food being cooked was Spanish, the daughter's room had a notice on it in Spanish saying 'keep out' and the door was locked (i.e. when clicked upon it wouldn't open).

Spanish tutorial and bar game The students were able to sit in the tutorial circle for a traditional virtual world social interaction. The students either used the audio chat or the text chat to communicate with other students or the tutor.

Interactions were all completed in Spanish. As the students entered the language learning site they were asked to take on a Second Life HUD (Heads Up Display- see full description in http://vivacity-games.co.uk/language-learning.html) to participate in the Bar Game, which was designed and developed by Vivacity Games. The HUD would provide them with a 'drink gauge' showing how thirsty they were and would change their avatars appearance, with thirsty animations, when it reached zero (see figure 1). These visual feedback systems were thus analogous to gaming status bars in that they help to identify and monitor avatar motivated language interactions.

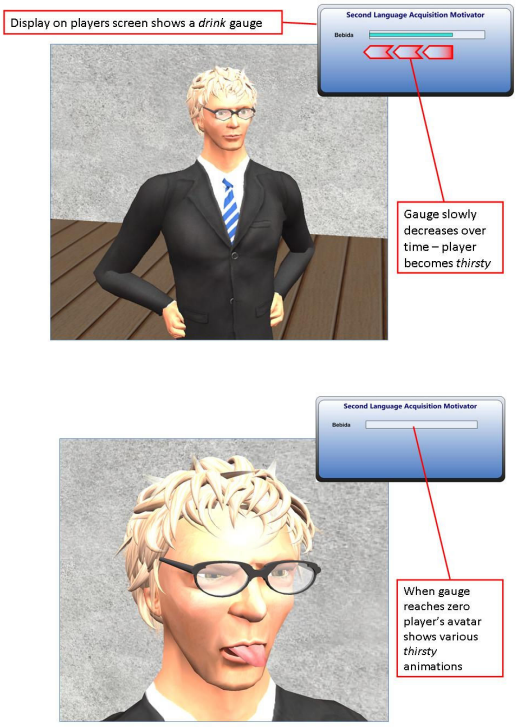

Figure 1: Student avatar with thirsty gauge and facial expressions.

This expression on the avatar would continue until the student went to the bartender for a drink. The bartender would only respond with a drink for the student if they asked for it correctly and if this was completed the avatar would lose the thirsty animation and their drink gauge would increase (see figure 2.)

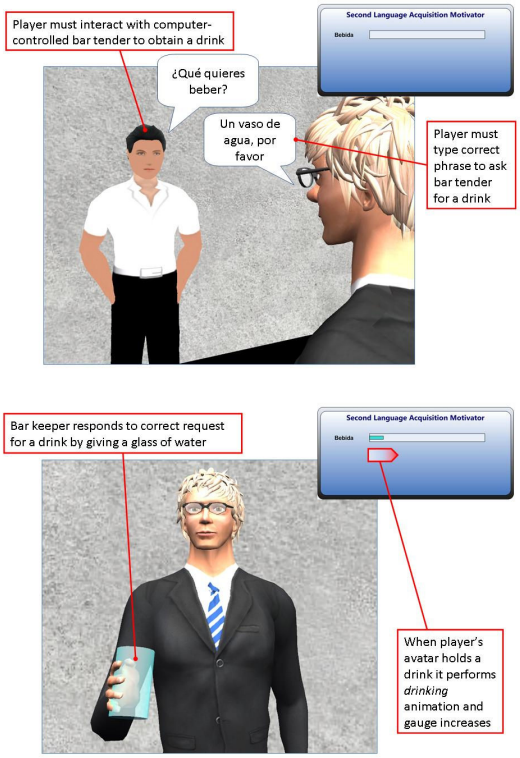

Figure 2: Automated bartended avatar with language usage for drink to increase gauge.

Research procedure

The students arrived for an initial induction session which supported them in developing their avatar and Second Life interaction skills. Six follow on tutorial sessions were conducted by the second, third and fourth authors inworld, in a traditional tutorial setup (i.e. all students sitting around in a circle). Students were invited to explore the Spanish House which was situated next to the tutorial. To that effect, they would be escorted in and out of the house by the second author. The first author, who was represented by an avatar (see figure 3), arranged to interview students inworld, through text and audio communication channels. The participants then explored the simulation and were observed by the researcher using remote camera viewing. Key critical incidents and interaction patterns were recorded throughout this exploration. After the students' avatars left the house

they completed a further inworld interview with the researcher. The interview data were recorded, transcribed and analysed.

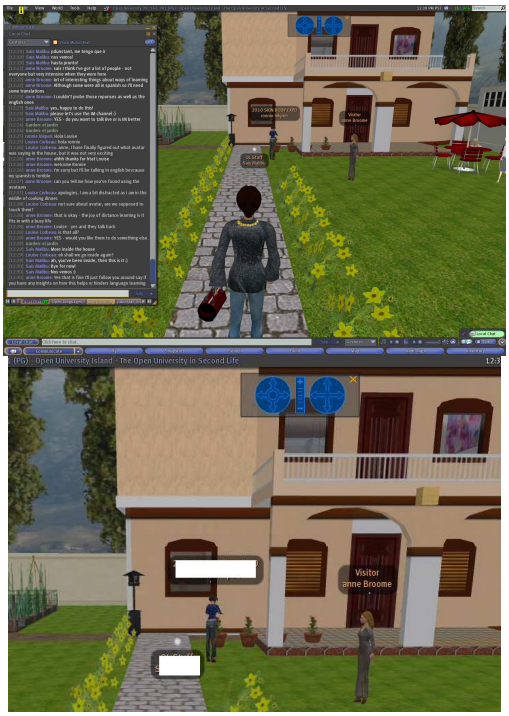

Figure 3. Interviewer avatar outside the Spanish House

Situated learning and identity findings

The findings identified several accounts of how virtually simulated situations have an impact on language learning. For language learning, the findings highlighted the importance of having a psychologically reasoned situational placement, both within physical and social contexts. With regard to identity reformation three factors are detailed: (i) our identity within physical simulated situations; (ii) our identity within social simulated situations, and; (iii) virtual world concepts of self as a student.

Identity within physical simulated situations The findings from participant interviews identified that the students found the concept of 'setting a cultural scene' within the virtual world simulation very valuable for their learning experience as a whole. For example: *"Whole world experience, setting scene for Spain, was useful – I've been into a Portugal world but [this was] not in Portuguese, so linguistically a write off - but experience-wise good"* (St 11).

The physical placement of objects within appropriate contexts was designed so that it would help the students to cognitively map associative schemas between objects, their pronunciation and contextual location. The goal was to help students in developing mental models for objects within a house. As noted by several students this made learning the vocabulary easier than through many other more traditional methods (e.g. vocabulary lists): *"SL [second life] is more interactive than books and vocab lists [vocabulary lists]"* (St 3). The placement of these objects within physical contexts of use also supported the students in developing scenario that would support them in understanding the active use of the language in action.

> "maybe as well as a house, there could be the option for other scenarios, such as at the market" (St. 12)

This then allowed them to personally empathise with these scenarios and consider how they could utilise the settings of these objects in context.

> "[the house] covers the main objects you'd need to buy or replace when living in Spain" (St. 3)

Finally, the audio clips also were noted as helping them understand the pronunciation of objects within the right context of use. The multiple sensory input as well as increasing its realism also increased the complexity of the situation: *"Objects and sounds - more disorientating and more realistic… More naturalistic than Elluminate* (synchronous web conferencing system) *on one hand"* (St. 11). However this realism was noted as harshly breached when systems didn't fulfil expected norms of physical world behaviour: *"sliding downstairs / walking through walls, LESS REALISTIC"* (St. 11)

Identity within social simulated situations Virtual world simulation interactions allowed the students to explore their physical world identities within a simulated environment. Several students noted that the value of these environments is that although everyone co-exists within the same virtual world they enabled comfortable social interactions with people from a wide variety of physical world social, economic and cultural backgrounds. Students often valued the leak between real and virtual identities, as they could easily learn from experienced people with a multitude of different professional and physical identities. Language students in particular found the international appeal of Second Life beneficial: *"best thing - the number of physically local native speakers"* (St 6). The value of informal learning from native speakers whose identities were routed in a foreign language was especially valued by the students: *"It is good if you go to French people for example you pick up local colloquialisms, expressions etc."* (St 9).

The social interactions which were both audio and textual provided extra levels of interaction that could enable control over that interaction. Some of the students were positive about the increased communications media: *"Much better than just text chat"* (St 10). Whilst others retreated away from the interactive elements: *"nice house - left quickly, didn't want to speak"* (St 7). However, simply

interacting within the simulation allowed the students to uncover social norms for that culture which they could build into the learning development process. Opening a door and turning on the lights within different rooms allowed more realistic interactions within the world. The realistic structure of fireplaces, kitchens and balconies also gave a sense of being provided with a window into that culture.

As Goffman (1959) highlighted we strongly link to socially acceptable behaviour to specific social situations, . we would say and do things with our family that we wouldn't with our friends and visa versa, . and these different social situations consequently reveal different sides to our identity. Sometimes this led to embarrassment in social interactions. For example, one person walked in on an avatar sitting on the toilet causing the second avatar to leave quickly with comments of *'errr ohhhh arrrr excuse me'* (St 15). The fact that the avatar using the toilet was a large dragon did not seem to dispel the demonstration of norms within social interactions and the level of embarrassment presented by the avatar having opened the bathroom door on them. Another student inquired with the researcher why they hadn't been able to get into one of the family rooms and was embarrassed that they hadn't realised that they'd been informed by the little girl to keep out of her room. Although it is not necessarily an ethical approach to seek to embarrass students there is a grey line identified here since language students are frequently motivated to learn a language to save embarrassing situations when they don't understand what is being said or can't communicate what they mean. Reforming their identity to one that is comfortable using a foreign language can then be a useful motivator in language learning. Student 3 noted this discomfort *"At moment feel out of depth amongst people who have a lot higher level of Spanish to me"* but also noted how useful this was as a motivator for them *"Useful to urge people on"* (St 3).

One observation from some of those running the pilot was that although the tutorials had defined start and end times, some students were not very eager to leave at the end of the session. It is possible that their shared identity as language learners in Second Life was a contributing factor that motivated their wish to extend the learning experience beyond the set times.

Ultimately, the simulation presented various types of automated and real avatars which investigated some interesting contradiction in identity. Is this a real person's avatar or simply an automated person? Initial pilots with the static avatars in the house simulations identified problems with students confused by the concept of avatars looking and speaking like real people but just being automated programs. The representation of them as obviously false (i.e. card board cut outs) helped the students to clearly distinguish between the different real and artificial identities within this representation. It is interesting to note that the game automated avatar for the bartender (Pablo) remained looking like a real avatar which produced more natural interactions with him but again caused some confusion with some students: *"Met Pablo tried to have conversation with him but then realised he wasn't real person"* (St 5)

Virtual worlds concepts of self as a student As with many other virtual world research projects (e.g. Oishi, 2007) this study identified positive responses with regard to motivation, confidence building and enjoyment associated with language learning through the simulation and gaming interactions. The students noted that whilst traditional material could be poor motivational experiences this approach was: *"LESS boring"* (St 3). Most of the students highlighted concepts of 'enjoyment' and 'fun' when describing their interactions: *"I think it's a good idea! I enjoyed it!"* (St 12). Of particular interest in identifying why the students found this approach fun were the almost contradictory statements about its complex and confusing nature: "*The more I use SL the more I find new things and get more and more confused but it's fun"* (St 5). Changing concepts of space, place and identity allowed this environment to flexible but also complex which some people felt was disorientating and disconcerting or *"Odd"* (St 8) whilst others simply found it annoying: *"I've only been here a few minutes and it's very frustrating"* (St 13).

However these qualities were not necessarily considered by everyone as valuable for learning. Whilst some students found this language learning environments empowered the development of their skills and identity, others simply felt a discomfort at the ease with which they could reform their identities; *"It's just not me, but then its not supposed to be me - right?"* (St 4) One apparent conflict in developing situated identities that occurred was through the development of their student identity. Some participants' pre-defined concepts of learning and being a student clashed with the environment's realisation of these concepts. This ultimately lead to, apparently, contradictory statements highlighted how some students made clear distinctions between learning and emotive factors supported within these environments: *"haven't really learnt a lot of Spanish yet but talking to other students has been good for my confidence"* (St. 3)

This highlights some preconceptions that students have about the identity of a good student and how this relates to learning. Students' concepts of what makes a 'good' student and its relationship to elearning are poorly researched and key focus for further research. From an analysis of the interview data it could be said that 'good students' were perceived to have the following aspects to their identities: 'serious' about learning, goal orientated and achieving quantifiable results. These concepts led some students to perceptions of these environments as: "*Not so good for learning - fun though"* (St 8). The flexible nature of these environments encouraged some student to feel detached as they simply dipped into their virtual identities as they would 'arrive and then quickly go'. Other students were identified to have found a greater level of student presence through multitasking their real and virtual identities i.e. they could feel more involved as a student whilst at the same time keep their busy lives in the physical world going doing something else e.g. 'cooking for the family'. What this shows is how some people find it beneficial to adapt to this frequent duplicity of identities whilst for other it makes them almost 'sea-sick'.

Case study 2: Virtual world situated elearning

Social interaction is known to encompass implicit assumptions that are made to assure the interaction is successful. Concepts of ourselves and thus our identity (e.g. "I've been here before so I'm comfortable with this situation", "I'm not happy with this situation", "I don't understand how to behave in small enclosed parties") within those situations it's essential to aid and support our assessment of assumptions of those situations. We must remember though, If those assumptions are incorrect, we are more likely to misjudge a situation and act inappropriately. Equally if those assumptions are correct they can increase a sense of being engaged within that situation thus enhance attention. Within a learning context, however, it is important to understand what the implications of different environmental design decisions are both on our sense of self and student learning. All these factors then impact on how we see ourselves within different situations.

Evidence is presented here is based on work in Sweeny and Adams (2009). This study sought to review the concept of 'virtual self attention' when other variables are impacting on end-users learning focused interactions. The argument was proposed that the more immersed a user is, the more they will have an increased attention on their own avatar, rather than look at other areas of the screen. This is because they will be more interested in what their own avatar is doing, and identify with it, rather than looking at other activities or objects in the surrounding area. It was proposed that this, increased sense of self, was linked to an increased sense of presence in that situation. Hence the link between situation and the perception of ourselves within that situation is related. The following study reviewed concepts of situations, situated learning and their impact on a students' identity.

Study method

The previous study related to language elearning and focused on specific support for this discipline. This study relates to a generic review of learning within virtual worlds but again concentrates on interpretations of altered situations. As such the research into this world focuses on situated elearning and identity reformation within a virtual world situation. Within the virtual world settings three issues are focused on with regard to situated virtual identity formation and reformation:

- Situated Identity: concepts of identity formation within different virtual environments
- Situated Practice: The impact, within virtual worlds, of interactions with objects, environments and their own avatar.
- Impact of Elearning: The relationship of elearning within these environments with developments in identity formation.

The case study under review here is based upon the work in Sweeny and Adams (2009). Within this study an in-depth multi-method investigation from 12 virtual worlds participants was completed in three stages; initially a small scale within-subjects eye-tracking comparison was made between the role playing game 'RuneScape' and the virtual social world 'Second Life', secondly an in-depth evaluation of eye-tracking data for Second Life tasks (i.e. avatar, object and world based) was performed, finally a qualitative evaluation of Second Life elearning tutorials in comparative 3D situations (i.e. environments that are; realistic to surreal, enclosed to open, formal to informal) was completed.

The hardware for eye tracking is a useful tool for determining where a user is gazing at any time through recording eye movements. Previous studies have used this method to test immersiveness to see if the nature of the eye movements are altered as a user becomes more immersed (Cairns et al., 2006). In contrast this study reviewed the concept of participants foci of attention so that the more immersed a user is, the more they will have an increased attention on their own avatar, rather than look at other areas of the screen (Sweeney & Adams, 2009). As a user progresses through a virtual world they are presented with a range of stimuli, and will look at various parts of the screen. However, once immersed, it is argued, they will concentrate more on their interaction with that world than the world itself. This would then impact on their increased concept of self and identity within this world rather than their removed interaction with it as a distanced observer of the world.

Research procedure: stage 1

Initially an evaluation was completed on the impact of environmental interactions (i.e. social world compared to gaming) upon end-users attention and thus immersion levels. This was completed through a small scale within-subjects eye-tracking assessment made between the role playing game RuneScape and the virtual social world Second Life(see fig 4). An attempt to standardise environment interactions (e.g. position of the camera and viewing see fig 4) however, some controls are standard to the environments.

Fig 3. RuneScape (Left) and Second Life (right) interactions with 'in picture' image of participants

Within further detailed in-depth analysis of the Second Life the participants were divided into three types. First of all the 'World' tasks consisted of activities where participants were dealing with the general environment, for example navigating to various places. Within 'Avatar' tasks participants were concerned with their own avatar, such as changing their Second Life appearance. Finally 'Object' tasks were concerned with the activities which had participants doing things with objects inworld, such as, for example, carrying out building tasks.

This first study used six university staff members as participants, all of whom were women that were unfamiliar with either of the worlds, although participant number five had played other role playing games.

For the purposes of these experiments a female Second Life avatar was created which complied with RuneScape regulations stating that individual RuneScape avatars were created and brought through the game's orientation tutorial. To ensure that each person had the same starting point in the game, the avatars were placed in the same position in the game world. This was important because in a role playing game, as a player progresses their avatar's characteristics change. Each participant was then asked to log into Second Life and carry out a number of

standard tasks, such as navigation, teleportation, changing avatar appearance, and so on. The full duration of the sessions was approximately thirty minutes with a break in the middle after which the participants then carried out standard tasks in RuneScape, such as navigation, fighting monsters, fishing, starting quests, and so forth.

The experimental design of the tests ensured an increase within the initial task engagement and immersion to allow for standardized comparisons between general world engagement as opposed to initial encounters and interactions with obstacles. However, to counterbalance the rigidity of an experimental approach an attempt was made to ensure a naturalistic yet focused approach to interactions. To increase this relaxed atmosphere instructions were called out and participants were free to ask for help if they didn't understand anything. Participant were informed about their ability to carry out slightly different activities, whilst the verbal instructions ensured a level of standardization between participants' tasks. It was hoped that taking this approach to tasks increased the likelihood that they were naturalistic while still being standardized.

Findings: immersion and sense of self within a virtual situation.

The findings from this study (Breen & Adams, 2009) identified that there was an increased end-user focus in a gaming environment (RuneScape) compared to social world interactions (Second Life). In fig. 4 we can see the time spent in the central area as a percentage of the game window, which was 44% for Second Life and 56% for RuneScape to the nearest integer. These initial findings, although not statistically significant differences do highlight an increased level of end-user focus within the gaming world compared to social world interactions.

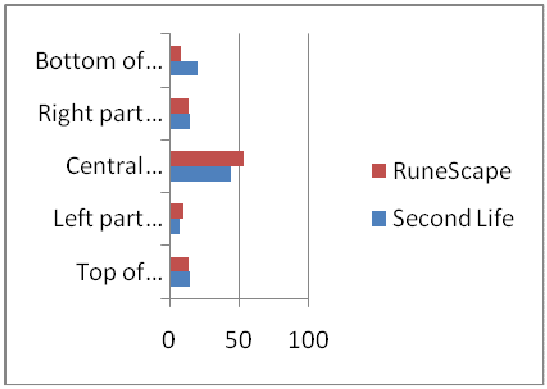

Figure 4: percentage of attention focus for Second Live and RuneScape.

For the researchers to understand how alternative social world designs might impact on attention a set of further eye tracking analysis procedures were conducted on just the Second Life data. Within this analysis the time spent looking at the central part of the screen was analysed for each of the separate tasks. The intention of this analysis was to see if the participants were more or less immersed during the different types of activities.

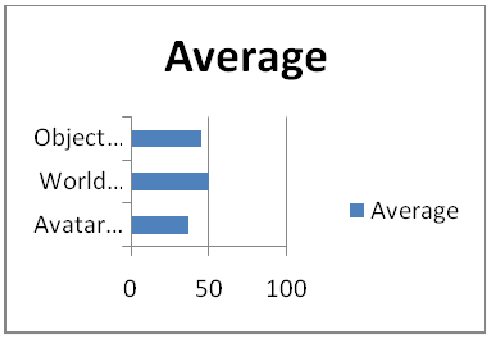

Figure 5: Average percentage by tasks in Second Life

This analysis found that Second Life interactions specifically for 3D world exchanges increased participants' focus more than with object and avatar tasks. The average percentage time spent in the central region (to the nearest integer) was 37% for avatar tasks, 50% for world tasks, and 45% for object tasks (see figure 5). This analysis identified that Second Life interactions on 3D world tasks increased participants' focus more than with object and avatar tasks. Ultimately interaction with an environment impact on attention levels and thus could be argued to increase a sense of being there.

Research procedure: stage 2

At stage two within the research six participants attended a series of Second Life virtual world tutorials. The student participants were studying a second-level course in Pure Mathematics. Introductory material for this course, covered linear algebra, group theory and real analysis. This material was circulated beforehand and then discussed during the tutorials. For this experimental procedure in-world voice facilities were utilised, whilst conversations were controlled via turn-taking. However, students were allowed to use text-chat to ask questions or indicate their desire to speak.

At the beginning of this study there were three orientation meetings completed (see figure 6), which were then followed by seven tutorials. Sessions were initially

deemed essential to allow students to overcome technical problems and learn about the environment.

Within these elearning tutorials virtual world settings were altered to identify the impacts of virtual world situations on situated learning. Situations were devised according to three separate factors;

- Realistic to surreal,
- Enclosed to open,
- Formal to informal.

Figure 6: Participants attending an orientation meeting in Second Life

For these studies several situations used were: two different platforms in trees, one which had couch-like seats, a purpose-built classroom and a corridor in the sky (see figure 7), the same room with the roof removed, a purpose-built chessboard room with wall and chairs, and a bandstand.

Figure 7: One of the locations used for tutorials

It was deemed important to set up a forum on the university's intranet, where agendas and minutes of each session were posted for the students to utilise. Further data was collected in the form of an experiments log of comments made and lessons learned, in particular with relation to the practical and technical aspects of teaching in Second Life.

Finally telephone interviews were completed with five students and the data used for as a comparative analysis. Interview questions focused on four themes: participant perceptions of motivation, task interactions, input / output devices and 3D situations. This qualitative data were transcribed and thematically analysed in a grounded theory type approach.

Findings: situated awareness and identity

The findings identified several useful threads; however, this paper presents only one thread from a sample of the students which highlighted issues of attention. Ultimately the different 3D situation designs presented altered levels of task engagement and distraction through perceptions of comfort, fun and fear.

When the students were asked about the different environments, in general their opinion was that the differences didn't have a great effect. However there were issues of affective memories triggered by environments that impacted on end-user perceptions.

> 'I quite liked the tree house. ...Silly reason for that is that going back to primary school it's quite nice sitting outside doing various things, and it kind of reminded me of that, and I thought this is kind of fun, it's good. ... The one with the roof open was quite interesting. As you said last night at that time as well we went through a complete day, where we had the dawn and then watched the evening and the stars came out. ... Yeah, it just reminded me of a sort of bar outside of a hotel you know where you sit in an evening. That was OK actually, but there is something about somebody sort of standing around who you're not quite sure who they are, 'Oh, who are they then?' (Student 1)

Although none of the students were found to like the classroom with the roof on, as it was closed and had no windows. Two of these students did conclude that they had felt mildly claustrophobic in real life situations.

> 'I think the only one that I actually disliked was the M208 classroom with the roof on. It just felt very weird, it was like going down into a cellar it was very closed in. It was just, er, I just found it quite unpleasant. It reminded me ... that I'd just sort of gone down into a dark cave. Once you removed the roof, once you got into the corridor it was pretty much the same as the others. ... I don't like small spaces without light, so that probably had an effect on it.' (Student 3)

> 'I didn't like when we had the roof on, I think it was the M208 one, it was a bit claustrophobic ... and my favourite one was the SchomeBase tree-house, just because it was quite open. The classroom was definitely better with the roof off.' (Student 4)

However, it is important to note that when the participant was queried further with the question "are you claustrophobic in real life' the student concluded *'Yeah'*. In contrast the other students were positive about the whole experience, although one student was mainly negative, and more affected by the different environments than the others.

> 'Where we had the tutorial in the tree-house we kept falling off the platform, and so everything had to stop in the middle of the tutorial to fetch someone back from wherever they'd fallen to. Although entertaining that kind of thing was distracting from the actual tutorial itself. ... I felt the actual surroundings were distracting, and detracted from the lesson considerably. I mean they were very pleasant surroundings. It would have been nice to have been there in person ...' (Student 2)

Finally it should be noted that the students' comments for the closed classroom tutorial, ensured that they moved the tutorial the tree platforms. It is important to note that when the roof was removed from the closed classroom it was then possible to move the camera controls and look at the avatars in the classroom from a distance. However, apart from this one detail there were no differences in the lighting conditions between the closed and open classroom. This factor highlights some interesting issues about the claustrophobic reaction to this situation.

In conclusion, it should be highlighted that despite the students stating there was little difference between the environments, they still used very emotive language when describing them. Comments continued to be made, which were not recorded, that included students comparing the bandstand to places they had visited in the past, or talking about seasons such as being outdoors in the summer. Students' sensory memory triggered by these environments is clearly a starting point for further research. Ultimately it could be concluded from this research that there are interesting points relating to the research questions for situated identity, practice and their impact on elearning. In particular the findings highlight how an environment and a student's interaction with that environment have a direct impact on a student's attention. This can relate to a student's motivation to learn through engagement and a feeling of presence in that environment. However, this study highlights how emotive these environmental encounters are. Although a 3D world interaction can positively increase a student's motivation to learn through empathising with the environment, it can also trigger negative memories of similar situations and environments. These situations and the students emotive responses relate strongly to how they see themselves (e.g. as a student, as claustrophobic). What is interesting is how important these concepts of self then impact not only on abstract concepts of learning and professional development but also on practical concepts of attention.

Conclusion

Unlike previous studies relating to physical world situations within which students develop identities these studies focused totally on the reformation of digital virtual world identities. These studies identified how strongly a student's digital identity is bound to situations and previous experiences in physical world equivalents. However, despite virtual world's immersive removal from reality, identity issues did not relate primarily to digital identities but strongly to students' physical world identities. Regardless of how a student represented themselves within the world (e.g. changing sex, species or into fictional characters) physical world identities and social norms impacted strongly on their interactions.

Within the language learning study the findings identified the value of situational placement of objects, dialogue and scenes. Students appeared to empathise with these scenarios and relate them to personal needs. Although the study did not seek to review social interactions but situated simulation interactions, there was a strong impact of social norms and acceptable behaviour impacting on the students' behaviours. These behaviours had an impact on the comfort or discomfort the students felt in developing and changing their identities within virtual worlds. Static avatars for information and game playing roles were utilised within the simulations and tutorial settings. Established virtual world users were comfortable with real and artificial avatar constructions. New virtual world students were disturbed by this mixture of human-operated virtual world identities and artificial identities. However, the obvious artificial nature (e.g. some presented as card-board cut-outs) of some of these characters did support an ease of interaction according to changed perceptions of themselves. Gaming and role playing can often support us in extending our concepts of self through playing with versions of ourselves and reformulating our identities. Within this world it was decided that the concepts of self should be played with to support developing and extending the students through their learning. However, concepts of our identity as students are tightly interwoven with our perceptions of what it is to learn and what this should involve. Ultimately across all these findings stereotyped perceptions of what a student is and how learning should be had the strongest impact on their comfort and adaptability within the environment. Even some of those students who were motivated and enjoyed being within the environment perceived it more as fun than learning.

Within the second situated learning study participants were found to concentrate primarily on their environments and situations. Interestingly participants were found to relate powerfully to their physical world concepts of social self within social interactions. Although this wasn't the main focus of this study, social norms governing eye focus, space between people conversing and privacy still impacted strongly on social interactions. Finally personal concepts of comfort, fun and fear that often govern our physical world identities were found to translate directly into students' avatar identities. Students who were claustrophobic in the physical world found virtual world closed spaces unnerving. Environments (e.g. woodland) that

reminded students of previous experiences were found to distract them from focusing on elearning studies. In contrast, a socially accepted construction of a classroom increased attention levels. Ultimately, when designing elearning contexts we need to understand the strong links that remain, although hidden, between virtual world identities and physical world identities.

Virtual environments have the potential to distort the assumptions that guide our behaviour (Sweeney & Adams, 2009). They also have the potential to increase our sense of attention and of place thus making it more akin to those within face-to-face interactions. While the nature of the environment within a virtual world does not have as much effect as in the physical world, the findings detailed in these studies clearly show that virtual environments can still affect learning, which is more evidence that there is a genuine 'sense of presence' and 'genuine identities' in virtual worlds. The students' perceptions of 'claustrophobia' within a specific virtual context, their feelings of 'embarrassment' at opening a virtual bathroom door on an avatar on the toilet, or the ability of situations to spark memories of old places visited and establish empathy with specific scenarios in those settings – these all highlight an emotive level of immersion both within that situation and their virtual identity within that situation.

Concepts of ourselves are routed in situations both social and physical. We present sides of ourselves for different situations and often avoid developing and changing those concepts of self. As have been identified by the research detailed here reformation of identity can be supported or inhibited by different virtual world contexts. Within both studies there was a continuing notion of virtual worlds allowing easier adaption of realistic situations and identities. The ability for these to tap into students' physical world identities, memories and concepts of self was identified throughout both studies. However, within both studies students concepts of self and thus their identity was displaced by the flexibility of situations and representations of themselves and others. For some the resultant disorientation was a positive feeling whilst for others it was negative. What these studies reveal is the relationship between virtual world identities and experiences with those in the physical world. Our emotive responses to virtual world identities and experiences appear to be linked to the changing nature of these situations, out of our control, which we simply love or hate. This occurs in many immersive physical world situations which are out of our control. A roller coaster physically and continually changes our perceptions of the world around us. Theatre and films can unsettle concepts that we have of ourselves and our world. Many people, according to individual differences, can find these physical world experiences, as they find the virtual world experiences as emotively positive or negative. Understanding how emotive these situations can be will help us design learning situations more effectively. However, the worrying issue that the language learning project identified was the participants' stereotyped perceptions of student identities and learning experiences. Ultimately, without us challenging these biases towards what learning is, we cannot support students to advance and gain the most from education.

This chapter has identified several potential barriers to virtual world identity reformation based on the study evidence. The evidence has highlighted the socio-cultural underpinnings behind these obstacles frequently related to physical world identity norms and a fear of identity reformation. An over-riding concept throughout were the tensions between individuals' fluidity in identity formation and reformation in contrast to the rigidity of physical world professional, regulatory and some academic concepts of identity. Ultimately this leads to concepts of 'game-playing' to fit with expected and accepted identity norms. Part of learning is to understand the limits of these norms and how to play the identity game. It should be an 'identity game' that we seek to support students in playing. As such there are players, goals, rules and forfeits. Some of the goals and rules are understood well within elearning courses as well as teaching and learning objectives. However, we don't understand the unwritten rules, alternative goals, the players and the forfeits. More importantly as the game is continually changing, and as academics are frequently not active players, should our role be to support students in the official rules or support their understanding of how the game is currently being played? However, the next major problem in virtual world learning is the tension between changing concepts of the academics identity and role in learning. Academics don't understand their own identities and roles within these learning situations, let alone that of the students who are changing their identities. Ultimately, we need to have a better understanding of changing pedagogical models within online environments and academics new identities in student learning before we can seek to support students in their identity reformation through elearning

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